

What is claimed is:

1. A method for producing a titanium oxide, the method comprising the steps of:

(i) inertly heating to a temperature of at least 5 about 60 °C, a composition comprising a titanium compound and a solvent;

(ii) reacting the titanium compound with a base at a temperature of at least about 60 °C; and

(iii) calcining the reaction product.

10 2. The method according to claim 1, wherein the titanium compound is at least one compound selected from a group consisting of a titanium sulfate, a titanium oxysulfate, a titanium trichloride, a titanium tetrachloride, a titanium oxychloride, a titanium tetrabromide, a titanium 15 tetra-alkoxide and a titanium chelate.

3. The method according to claim 2, wherein the titanium tetra-alkoxide is at least one compound selected from a group consisting of a titanium tetramethoxide, a titanium tetraethoxide, a titanium tetra-n-propoxide, a 20 titanium tetra-isopropoxide, a titanium tetra-n-butoxide, a titanium tetra-isobutoxide, a titanium tetra-sec-butoxide, a titanium tetra-t-butoxide, a titanium tetra-2-ethylhexyloxide and a titanium tetra-stearyl oxide.

4. The method according to claim 2, wherein the titanium chelate is at least one compound selected from a group consisting of a titanium diisopropoxybis(acetylacetone), a titanium diisopropoxybis(triethanolaminato), a titanium di-n-butoxybis(triethanolaminato), a titanium di(2-ethylhexyloxy)bis(2-ethyl-1,3-hexanediolate), a titanium isopropoxy(2-ethyl-1,3-hexanediolate), a titanium tetraacetylacetone and titanium hydroxybis(lactato).

10 5. The method according to claim 1, wherein the titanium compound is a titanium oxysulfate.

6. The method according to claim 1, wherein the base is at least one base selected from the group consisting of a hydroxide of alkali metal, a hydroxide of alkaline earth metal, an ammonia and an amine.

15 7. The method according to claim 6, wherein the base is at least one base selected from the group consisting of a sodium hydroxide, a potassium hydroxide, a lithium hydroxide, an ammonia and a hydroxylamine.

20 8. The method according to claim 7, wherein the base is an ammonia.

9. The method according to claim 1, wherein the base is used in at least a molar amount needed to theoretically convert the titanium compound to a titanium hydroxide.

10. The method according to claim 1, comprising the steps of:

(i) inertly heating to a temperature of at least about 60 °C, a composition comprising a titanium compound, a 5 solvent and a base precursor of said base;

(ii) maintaining the heating temperature or further heating the composition so that the base precursor decomposes into said base, to react the titanium compound with said base; and

10 (iii) calcining the reaction product.

11. The method according to claim 10, wherein the base precursor is at least one compound selected from an urea, a thiourea, a dimethylurea and an urea peroxide.

12. The method according to claim 1 or 10, wherein 15 the calcination is conducted at a temperature of about 300 °C to about 800 °C.

13. The method according to claim 12, wherein the calcination is conducted at a temperature of about 350 °C to about 600 °C.

20 14. The method according to claim 1 or 10, wherein the reaction is conducted in the presence of water.

15. A method of producing a titanium hydroxide, the method comprising the steps of:

(i) inertly heating to a temperature of at least about 60 °C, a composition comprising a titanium compound and a solvent; and

5 (ii) reacting the titanium compound with a base at a temperature of at least about 60 °C.

16. The method according to claim 15, wherein the reaction is conducted in the presence of water.

17. The method according to claim 15 or 16, wherein the base is at least one base selected from the group 10 consisting of a hydroxide of alkali metal, a hydroxide of alkaline earth metal, an ammonia and an amine.

18. The method according to claim 17, wherein the base is at least one base selected from the group consisting of a sodium hydroxide, a potassium hydroxide, a lithium 15 hydroxide, an ammonia and a hydroxylamine.

19. The method according to claim 18, wherein the base is an ammonia.

20. The method according to claim 15 or 16, comprising the steps of:

20 (i) inertly heating to a temperature of at least about 60 °C, a composition comprising a titanium compound, a solvent and a base precursor of said base;

(ii) maintaining the heating temperature or further heating the composition so that the base precursor

decomposes into said base, to react the titanium compound with said base.

21. The method according to claim 20, wherein the base precursor is at least one compound selected from an  
5 urea, a thiourea, a dimethylurea and an urea peroxide.